Implementation and Evaluation of an Virtual Intelligent Agent

Mary Moore, Ph.D., National Library of Medicine, Bethesda, MD
Terry Ahmed, MLS, National Library of Medicine, Bethesda, MD

Abstract: Reference librarians at the National Library of Medicine answer over 100,000 client questions annually. Although many answers are the NLM Web, clients may have difficulty finding them. Using intelligent virtual agent software, the NLM launched Cosmo, the Customer Service Owl (http://wwwns.nlm.nih.gov/). Cosmo uses natural language pattern matching to answer common questions. Early evaluation shows Cosmo can answer 25% of questions asked, but some users mistake the service for chat reference or a search engine.

Clients contacting the National Library of Medicine need quick answers to common questions. The NLM Web search engine can return thousands of hits, but clients looking for specifics, like the organization chart or the dates for Board of Regents meetings, may have difficulty find the answers quickly. In the winter of 2002 the NLM purchased intelligent customer service software from NativeMinds. This software provides a Web "chatterbot" or intelligent software agent, and uses pattern matching and natural language processing to answer common questions. Clients type in their questions, and, if the virtual agent recognizes the question, it provides a response.

The purpose of the automated software is to:

1 Provide immediate responses to client questions
2 Provide consistent responses
3 Provide ability to escalate unanswered questions to e-mail or phone if needed, and integrate with other customer service knowledge bases
4 Increase clients' service options
5 Reduce service cost over time

Reference librarians drafted a "job description" for the automated agent. (The agent serves as a concierge, answering clients' routine questions, especially those questions dealing with NLM products and services. The agent is not a substitute for using NLM health databases. Likewise, the agent cannot answer complex questions and is not a substitute for a reference librarian.) Librarians scripted the answers to commonly asked questions and helped integrate health and drug information. Finally, they created a topic hierarchy and specialized conversational pattern lists, and tested and audited the system.

Early evaluation of log files shows some users are unfamiliar with automated agents, or chatterbots, and tried to use the conversation box as a search engine or live chat service. When a client types in a query within the agent's "job description," the automated agent appropriately answers more than 25% of questions asked. Unanswered questions are reviewed daily. If appropriate, the answers are scripted. Questions that are answered incorrectly usually result in reprogramming and debugging. As the automated agent "learns" and grows, it is expected the service will be cost effective, reducing the time human agents spend on repetitive questions and freeing them for higher-level duties.